

Daniil Markelov

Deep Reinforcement Learning Game Development

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ABOUT ME

I am a deep learning enthusiast, striving to bring intelligent systems into game development. I enjoy creating games and training deep reinforcement learning agents to play them. I believe that games make great environments for reinforcement learning research because of the variety of possible tasks and the relative cheapness of development, training, and deployment.

EDUCATIONAL BACKGROUND

Advanced Diploma in Game Development

CENTENNIAL COLLEGE

The program covered all aspects of game development in Unity, and I put emphasis on learning C# and deep reinforcement learning. During my studies, I took part in various game jams and projects, which taught me the practical aspects of game development.

Deep Reinforcement Learning Nanodegree

UDACITY

We started with tabular methods and the basics of dynamic programming and then moved on to DQNs and PPO. It was a lot to cover in such a short time, and this program inspired me to keep looking into the topic on my own.

PROFESSIONAL EXPERIENCE

Developer

TRANSITIONAL FORMS (2023 – PRESENT)

- Research, design and prototype intelligent systems with the aim of enhancing new and existing projects
- Optimize and accelerate Deep Learning/Reinforcement Learning training and inference pipelines
- Evaluate AI algorithms and features using subjective or ambiguous metrics
- Maintain and document existing codebase, follow coding style and practices, participate in reviews
- Actively communicate with the development and creative teams to address outstanding issues
- Implementing solutions around fluid and ambiguous requirements that may break early design assumptions
- Contributing to the overall design and development of games and generative experiences

Game developer / Programmer

COMET STUDIOS (2020 – 2022)

- Developed collectibles and equipment systems, enemies, bosses, wave generation system and difficulty multiplier
- Collaborated with other programmers to create a general code architecture and support existing code systems
- QA, outlined the balancing direction and adjusted the difficulty of the game's progressing
- Tightly worked with a design team to implement their game vision and outlined tasks during agile processes and standups

PROJECTS

Space RTS Dots – AI and Gameplay

A multi-threaded multi-agent environment where hundreds of agents compete to survive in a battle-royale style game.

Fealty to the King – AI and Gameplay

A unique turn-based board game with a chess-RPG blend of rules. By using reinforcement learning and self-play, I developed and trained an agent to play against a player.

Doodle Jump – AI and Gameplay

Made to design and compare different perception systems for reinforcement learning agents and try out different training algorithms.

Dino – AI and Gameplay

Efficient decision-making for agents in continuous time environments.

Tools for ML-Agents – Programming

Streamlining the process of training and use of techniques similar to Population Based Training.

SKILLS

- C#, Python
- Unity, Unreal
- ML-Agents, Tensorflow, PyTorch, Scikit-Learn, RLlib, Stable Baselines
- Rider, PyCharm
- GitHub, Bitbucket
- Jira, Trello
- English, French, Russian